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ABSTRACT

This paper analyzed the evolution of formal education in Africa with emphasis on the weaknesses and strengths of the system identified. Although the roots of modern education can be found in the early institutions of learning and libraries of Alexandria and Timbuktu in Africa, the continent today lags behind in all the fields of formal education. The teaching of science in most African educational institutions, at all levels, has been reduced to theoretical description of scientific facts. Several factors have contributed to the present situation of education in Africa. This paper describes some of the factors responsible for the state of science education and education in general, prevailing in most African countries. The most prominent factors affecting education in Africa include policy framework of individual countries, access into educational institutions and population pressure, quality and affordability of education, and undue emphasis on employability of graduates, among others. Reliance on the Western educational system without resources to back it up is discussed. Innovative ways of financing education and development of syllabi based on analysis of culture and environment have promise for the future. Educational institutions with appropriate syllabi and attitude could greatly enhance technological development. Enhancement of the role model of teachers and their motivation underscores the success of future education and science in Africa. (DK)

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EDUCATION AND SCIENCE IN AFRICA: POSSIBLE WAYS OF IMPROVEMENT IN THE NEXT DECADE

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Education and Science in Africa: possible ways of improvement in the next decade

by

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ABSTRACT

Evolution of formal education in Africa has been analyzed with emphasis on the weaknesses and strengths of the system identified. Reliance on the Western educational system without resources to back it up has been scored. Innovative ways of financing education and development of syllabi based on analysis of culture and environment have promise for the future. Educational institutions with appropriate syllabi and attitude will greatly enhance technological development. Lastly, enhancement of the role model of teachers and their motivation underscores the success of future education and science in Africa.

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INTRODUCTION

Africa as a continent is the cradle of modern education. The history of Education dates back to early institutions of learning in Alexandria and Timbuktu with their fine libraries. Despite this fact, Africa today lags behind in all the fields of formal education. Universal primary education has not been met. Secondary education is limited to a few, university education is at a critical cross-road between producing quality university graduates and mediocre, low quality, ill equipped university graduates. The teaching of science in most African educational institutions, at all levels, has been reduced to theoretical description of scientific facts. Well equipped science laboratories are non existent in most schools. Yet, studies in learning prove that enjoyable self learning is achieved by students in the laboratory. Several factors have contributed to the present situation of education in Africa. This paper describes some of the factors responsible for the state of science education and education in general, prevailing in most African countries. Most prominent factors affecting education in Africa range from policy framework of individual countries, access into educational institutions vs population pressure, quality vs affordability of education, undue emphasis on employability of graduates etc.

EVOLUTION OF AFRICAN EDUCATIONAL SYSTEM

Despite the initial rich history of education in Africa, the present educational institutions, as we know them today, were started by missionaries or colonial governments. The missionaries used schools as a vehicle for propagation of Christianity. The colonial governments began to train the few elites who could do manual jobs. Such institutions were not by nature intended to train highly skilled manpower, especially in science. Yet the educational systems prevailing in Africa have been modelled against Oxford and Cambridge universities, University of Sorbonne, University of Rome, etc. without necessarily having the culture or for that matter the resources of England, France, Italy, etc. The syllabi at primary, secondary, or, secondary, or university level read very much like those of educational institutions in Great Britain, France, United States of America, etc. Very few African educational institutions have succeeded in absorbing African culture and environment to evolve syllabi that are africanized yet scientific.

It may be argued that scientific knowledge is universal and it makes no difference where it is taught. The proponents of this argument have to some extent a point to make. However, what is often forgotten is the fact that science, especially its introduction, has to be related to every day life. An atom has no place in most African languages or concepts. Yet its knowledge is critical in the understanding of modern science. How then do we introduce the concept to an African child and at what age? This is just but one such concepts I have chosen to emphasize the role of culture and environment in the teaching and learning of science. I would have chosen a simpler concept of heat conduction to illustrate my point as well. Most African children know that when it is hot the soil becomes warm, the stones become hot and one does not sit in the sun. However, few would associate such heat with movement of electrons. The word electron is non existent in their vocabulary. One would have to search deeper into the languages of Africa and the culture to explain conduction of heat concept. Let me return for a few moments to the evolution of educational institutions in Africa. The missionaries started schools to teach people how to read the Bible. A few bright students were chosen to be

trained as deacons/deaconesses, pastors, priests etc. The mission of training was therefore not to develop culture or science as the two were at variance with religion. Similarly, the few schools started by colonial governments were to train clerks. Science education as we know it today was not the mission of either the educational system in the pre- and during colonial era. After independence, the emancipated African governments opened up the access to education. A few more people were admitted into elite schools to form the next elites in society. Education became a powerful symbol for mobility in society. More and more political demands were placed on African governments to expand access into educational institutions. The response was to build more schools at all levels, to train more teachers using the same syllabi used during colonial era. Few cosmetic syllabi changes were introduced to placate nationalists who wanted radical changes in the system. For example, in my country, Kenya, the recommendation of the first Education Commission, the Ominde Commission, was never fully implemented.

An argument is presented that implementation in Africa of the educational system identical to the system prevailing in Europe and North America without first analyzing the socio-cultural factors, the African environment, thereby designing the African educational mission and objectives have negated the development of high quality science in the continent.

The inheritance of the colonial educational system brought with it the emphasis placed in passing qualifying examinations in all African examination systems. The selection criteria used for admission into the universities and, naturally into secondary schools, emphasize passes at entry level examinations. Whatever the universities use as entry requirements for admission tend to become what secondary schools and indeed primary schools emphasize. In no other country than in Africa does excessive academic criteria distort the primary and secondary schools toward curricula that are ill-suited for the vast majority of students, who do not go on to university. The few who make it to university are further disadvantaged by the same examination mania. In general, the examination system administer tests that emphasize memorization, do not encourage problem-oriented learning. As a result, the existing system is susceptible to influence, nepotism and sometimes corruption.

ENROLMENT PRESSURE

No African government can freely and drastically reduce its expenditure in education without serious political consequences. The reason is simple. The fact is that most governments have historically championed the policy of elimination of ignorance and have in some form or another promised the attainment of free universal education. Second and most important is the high stake given to education by majority of African family. In terms of cost benefit analysis, the African family risk most in education. Education is to most families in Africa the prime ladder in climbing the societal status.

The enrolment trend in all African countries is in the increase at all levels. However, despite the increases in enrolment in African educational institutions, it is sad to note that universal primary education has not been achieved in Africa. Secondly, less than one quarter of secondary school cohort have a chance to enter university and a mere 5.7% ever make it to tertiary education compared to the same cohorts in developed countries. The problem with enrolment into African educational institutions is its

affordability by the state or family and not numbers, Table 1 gives enrolment ratios of the world.

Table 1. ENROLMENT RATIOS FOR REGIONS OF THE WORLD (1986)

(Percent of School Age Population)

Region	Primary	Secondary	Tertiary
Anglophone Africa	77.00	17.00	1.20
Kenya*	82.00	27.75	7.00
Francophone Africa	46.00	14.00	2.40
South Asia	71.00	19.00	4.40
East Asia & Pacific	87.00	43.00	9.10
Latin America	90.00	44.00	12.00
Mid. East & N. Africa	82.00	30.00	9.40
Developing Countries	75.00	23.00	6.90
Developed Countries	100.00	80.00	21.00

Source: Donald R. Winkler (1990): Higher Education in Latin America: Issues of Efficiency and Equity. World Bank Discussion Papers No. 77.

* Data for Kenya has been derived from: Kenya: Public Expenditure Review - Education Sector, World Bank Report 1993. The data is for 1993 school year only.

Table 2 provides expenditure per students in regions of the world. The Table reveals a startling but accepted fact that developing countries, and especially African Countries spend more per student in secondary and higher education than any other region. This pattern of expenditure has a historical reason.

Table 2. PUBLIC EXPENDITURE PER STUDENT IN REGIONS OF THE WORLD (As a percentage of per Capita Income)

Region	Primary	Secondary	Tertiary	Cost ratios*
Public Expenditure (1980) (**)				
Anglophone Africa	18	50	920	51.20
Francophone Africa	29	143	804	27.70
South Asia	8	18	119	14.90
E. Asia & Pacific	11	20	118	10.70
Latin America	9	26	88	9.80
Mid.East & N.Africa	2	28	150	75.00
Kenya***	28	68	1052	37.60
Developing Countries	14	41	370	26.40
Developed Countries	22	24	49	2.20

* Cost Ratios = Higher Education Unit Cost/Primary Education unit cost

Sources: ** Jee-Peng Tan & Alicon Mingat (1989): Educational Development in Asia: A comparative study Focusing on Cost and Financing Issues. Report No. 10P 51. The World Bank.

*** Kenya: Public Expenditure Review-Education Sector, World Bank Report 1993. The data is for expenditure averages of 1989/90 to 1993/94 years.

From the above two tables, it is clear that the improvement of access, quality and equity in education and science depends very much on how it will be financed. Much more important is the fact that any future policies on education and science for Africa must involve fundamental changes in policy and innovative ways of funding the system.

New approaches to improvement of education and science in Africa should as a first priority involve the empowerment of the family to gain meaningful employment. With proper socio-economic policies, gainful employment is achievable in most African countries. However, assistance by developed countries directed at the family, the community, as a first priority is essential for this to succeed. Age for mega projects is gone. Clear decision should be made for small projects with impact on uplifting the family. Financing education is one such projects.

STRENGTHENING OF EDUCATIONAL INSTITUTIONS

The role of African governments in the management of educational institutions have contributed greatly to their development. There are very few private educational institutions in Africa of world repute. The reputation of African universities lies very much on the management styles and financial resources availed to such institution by the government. In general, the role of most African governments has been positive and commendable. However, the African governments are today faced with increased human populations, dwindling financial resources, heavy economic debts, changed national, regional and international economic structure. It is for these reasons that the African government leaders should accept that even if they so wished they can no longer provide resources to education as was the case a few years back. Given these hard options, the governments of African states have to adopt a flexible attitude and approach to the governance of educational institutions. African educational institutions have of late relied more and more on the community (those using its products), the beneficiary, (the individual student and his/her parents) for the financial and other resource support. To encourage and support this newly introduced cost-sharing system, the governments must play an influencing and coordinating policy formulation role. The empowerment of the school/institution organs responsible for the governance to decide on how to raise and spend funds must be given to such organs by the government.

This may include, in some ways, the decision on hiring and firing of staff. Educational policies and quality syllabi that reduce the unit cost per student shall greatly enhance the science education in Africa. To develop such syllabi may involve training and retraining of teachers in the analysis of culture, language, and environment of each institutions' people. Certainly, it also involves proper analysis of technological development within a region, a country and the role each institution would play in the improvement of that industry.

In essence, the improvement of education in Africa requires the granting of Autonomy to the educational institutions, it requires also the exercise of Academic Freedom by the educational institutions in a responsible and society supportive way. Since the beneficiary is being called upon to meet more and more of the cost of running the institution, he must be made welcome to participate in the governance of the educational institution not only by the government but also by the institution. Persons placed at leadership of academic institutions must accept that only innovative management and administration of such institutions shall result in success. There are no short cuts to this approach.

In this respect, I see a very important role for UNESCO and other international bodies in not only assisting African Governments in implementing new approaches to management and financing of education but also to training of present and future managers of educational institutions.

TECHNOLOGY MANAGEMENT

Japan, South Korea, Singapore, etc. are quoted as living and every day examples of societies that have made technological break through for most developing countries to emulate. Often, the above countries have exemplified all that is good and need adapting and adopting in order for a country to succeed technologically. There is absolutely nothing wrong in giving the above countries as examples. The mistake done lies in the assumption, by those who quote these examples, that any country can study and assimilate in total their success. Such successes are not portable. Success in management of technology cannot be promoted by examples of past glories. It cannot be promoted by merely glorifying successes in various economic, cultural and environmental setting different from the one prevailing in a country.

Therefore, in order for us to promote education in the next decade, we must have in place an educational system that would promote a thorough analysis of our culture, environment, technological and industrial capacities and needs, and an economic policy that would create work and employment. In this respect, more emphasis will have to be placed in Basic Sciences than hitherto by African States. In so doing these states will have at their disposal Basic Sciences they can apply. They (states) cannot apply what they do not have.

Corollary to this is the fact that admissions into universities in Africa is market driven. As long as Basic Sciences are synonymous with low wages there will be no bright students taking up these subjects. Indeed, Africa has wasted its most talented brains by involving them into academic fields concerned with application of knowledge than development of knowledge. This trend has to change.

As we prepare ourselves for changes in education, we should as well accept that one of the enviable changes in education shall involve development of an educational system that will analyze our environment, firms and industry, work group and people to create research that will lead to technology development, deployment, adoption, adaptation, implementation and routinization. These are the accepted steps of technology development that lead to enjoyable work and employment.

The role of the teacher is basic and critical in all the above named proposals. As long as we continue to have in place high value and worship for money, no society will pay teachers enough. Further more, no society will attract quality teachers to the profession. The success of education and science depends on the uplifting of both the morale and economic value of the teachers. Teachers must be fully motivated and satisfied with their work. There is no singular formula to achieve this. However, each society shall put in place policies that would uplift the status of the teacher in a society.